

## Strenx Tube 700MLH

### General Product Description

Strenx Tube 700MLH is an HF-welded cold-formed structural hollow section made of hot-rolled high-strength steel with a minimum yield strength of 700 MPa.

Its high strength combined with naturally stiff form of welded hollow section enables construction of stronger and lighter structures. Strenx Tube 700MLH meets or exceeds the requirements of prEN 10219 (2016) and it is CE marked according to EN 1090-2. Typical applications include load-bearing structures in the lifting, handling and transportation segments, especially in conditions that require extremely good toughness.

Strenx Tube 700MLH is available in circular, square and rectangular shapes. Other shapes and sizes are available upon request.

The maximum length of the tubes is 12-18 meters, depending on the size. Longer or cut-to-length tubes are available upon request.

Hot dip galvanizing Strenx Tube 700MLH hollow sections may lead to cracking. Please consult SSAB Tech Support prior galvanization.

### Dimension Range

Strenx Tube 700MLH is available at circular, square and rectangular shapes.

Circular	33.7- 323.9 mm
Square	30x30- 300x300 mm
Rectangular	50x30- 400x200 mm
Wall thickness	2.0- 10.0 mm
Mill length	6000- 12 000/18 000 mm

Other shapes and sizes are available upon request.

### Dimensions

#### Circular

Diameter	2.0mm (kg/m)	3.0mm (kg/m)	4.0mm (kg/m)	5.0mm (kg/m)	6.0mm (kg/m)	8.0mm (kg/m)	10.0mm (kg/m)
33.7 mm	1.56						
42.4 mm	1.99						
48.3 mm	2.28	3.35					
60.3 mm	2.88	4.24					
76.1 mm	3.65	5.41	7.11				
88.9 mm		6.36	8.38	10.4			
101.6 mm		7.29	9.63	11.9			
108 mm		7.77	10.3	12.7			
114.3 mm		8.23	10.9	13.5			
127 mm		9.17	12.1	15.0			
133 mm		9.62	12.7	15.8			
139.7 mm		10.1	13.4	16.6	19.8	26.0	32.0
168.3 mm			16.2	20.1	24.0	31.6	39.0
193.7 mm				23.3	27.8	36.6	45.3
219.1 mm				26.4	31.5	41.7	51.6
244.5 mm				29.5	35.3	46.7	57.8
273 mm				33.1	39.5	52.3	64.9
323.9 mm					47.0	62.3	77.4

Recommended minimum batch sizes on mill orders.

Minimum batch size, m

3000

1500

500

Metric weight, kg/m

.....≤ 5

&lt; 5..... ≤ 20

&gt; 20.....

## Square

Height x Width	2.0mm (kg/m)	3.0mm (kg/m)	4.0mm (kg/m)	5.0mm (kg/m)	6.0mm (kg/m)	8.0mm (kg/m)	10.0mm (kg/m)
30 x 30 mm	1.68						
40 x 40 mm	2.31	3.30					
50 x 50 mm	2.93	4.25					
60 x 60 mm	3.56	5.19	6.71				
70 x 70 mm		6.13	7.97	9.70			
80 x 80 mm		7.07	9.22	11.3			
90 x 90 mm			10.5	12.8			
100 x 100 mm			11.7	14.4	17.0	21.4	
120 x 120 mm			14.3	17.6	20.8	26.4	
140 x 140 mm			16.8	20.7	24.5	31.4	38.1
150 x 150 mm			18.0	22.3	26.4	34.0	41.3
160 x 160 mm				23.8	28.3	36.5	44.4
180 x 180 mm				27.0	32.1	41.5	50.7
200 x 200 mm				30.1	35.8	46.5	57.0
220 x 220 mm					39.6	51.5	63.2
250 x 250 mm					45.2	59.1	72.7
300 x 300 mm						71.6	88.4

Recommended minimum batch sizes on mill orders.

Minimum batch size, m

3000

1500

500

Metric weight, kg/m

.....≤ 5

&lt; 5..... ≤ 20

&gt; 20.....

## Rectangular

Height x Width	2.0mm (kg/m)	3.0mm (kg/m)	4.0mm (kg/m)	5.0mm (kg/m)	6.0mm (kg/m)	8.0mm (kg/m)	10.0mm (kg/m)
50 x 30 mm	2.31						
60 x 40 mm	2.93	4.25					
70 x 50 mm	3.56	5.19	6.71				
80 x 40 mm	3.56	5.19	6.71				
80 x 60 mm		6.13	7.97				
90 x 50 mm		6.13	7.97				
100 x 50 mm		6.60	8.59				
100 x 60 mm		7.07	9.22				
100 x 80 mm			10.5				
120 x 60 mm			10.5	12.8			
120 x 80 mm			11.7	14.4	17.0	19.4	
150 x 100 mm			14.9	18.3	21.7	27.7	
160 x 80 mm			14.3	17.6	20.8	26.4	
180 x 100 mm			16.8	20.7	24.5	31.4	38.1
200 x 100 mm			18.0	22.3	26.4	34.0	41.3
200 x 120 mm				23.8	28.3	36.5	44.4
250 x 100 mm				26.2	31.11	40.23	49.11
250 x 150 mm				30.1	35.8	46.5	57.0
260 x 180 mm					39.6	51.5	63.2
300 x 200 mm					45.2	59.1	72.7
400 x 200 mm						71.6	88.4

Recommended minimum batch sizes on mill orders.

Minimum batch size, m

3000

1500

500

Metric weight, kg/m

..... ≤ 5

< 5..... ≤ 20

> 20.....

## Mechanical Properties

Yield Strength Rp0.2 (min MPa)	Tensile Strength Rm (MPa)	Elongation A <sub>5</sub> <sup>2)</sup> (min %)	Charpy-V -50°C 10x10 mm test specimen <sup>1)</sup> (min J)
700	750- 950	10	27

Mechanical properties meet the requirements of prEN 10219 (2016).

The mechanical properties for rectangular hollow sections are tested by SSAB on the longer side of the cross section.

<sup>1)</sup> Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 6mm. The specified minimum value corresponds to a full-size specimen.

<sup>2)</sup> The hollow sections with D/T < 15 (round) or (B + H)/2T < 12,5 (rectangular and square), the minimum value of elongation is reduced by 2.

## Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al <sub>tot</sub> (min %)	Nb (max %)	V (max %)	Ti <sup>1)</sup> (max %)
<b>0.12</b>	<b>0.25</b>	2.10	0.020	<b>0.010</b>	0.015	0.090 <sup>1)</sup>	0.20 <sup>1)</sup>	<b>0.15<sup>1)</sup></b>

Chemical composition meets or **exceeds** the requirements of prEN 10219 (2016).

In addition, boron (B), molybdenum (Mo), nickel (Ni) or copper (Cu) may be used as alloying elements either singly or in combination.

The steel is grain refined.

1) Sum of Nb, V and Ti = max 0.22%

## Typical Carbon equivalent

Typical CET	0.24
Typical CEV	0.38

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40}$$

$$CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

## Tolerances

Characteristic	Circular hollow sections Tolerances meet or <b>exceed</b> the requirements of EN 10219
Outside diameter (D) <sup>1)</sup>	±1%, however a minimum of ±0.5 mm and a maximum of ±10 mm
Out-of-roundness	2%, when D/T ≤ 100
Thickness (T)	When D ≤ 323.9 mm: <b>-5%/+10%</b> , with a minimum of ±0.2 mm and maximum ±0.5 mm When 355.6 ≤ D ≤ 406.4 mm <sup>3)</sup> : ±10%, when T ≤ 5 mm / ±0.5 mm, when T > 5 mm When D > 406.4 mm <sup>3)</sup> : ±10%, with a maximum of ±2 mm
Straightness	0.20% of total length and 3 mm over any 1 m length
Mass per unit length	Individual tube: ±6%
Mill length	0/+50 mm, 6000 ≤ L ≤ 12000- 18000 mm (standard lengths 6000 & 12000 mm)
Exact length	Agreed at the time of enquiry and order

<sup>1)</sup> All external dimensions are measured with a minimum distance from the end of the section. The distance must be a minimum of 100 mm.

Characteristic	Square hollow sections Tolerances meet or <b>exceed</b> the requirements of EN 10219
Outside dimensions (B, H) <sup>1)</sup>	When B, H < 100 mm ±1 % minimum ±0.5 mm When 100 mm ≤ B, H ≤ 200 mm: ±0.8% When B, H > 200 mm: ±0.6%
Thickness (T)	<b>-5%/ +10 %</b> , with a minimum of ±0.2 mm and maximum ±0.5 mm
External corner profile	When T ≤ 6 mm: 1.6 x T–2.4 x T When 6 mm < T ≤ 10 mm: 2.0 x T–3.0 x T When T > 10 mm: 2.4 x T–3.6 x T
Squareness of side	90° ±1°
Concavity/convexity	0.8%, with a minimum of 0.5 mm
Twist	2 mm + 0.5 mm/m
Straightness	0.15% of total length and 3 mm over any 1 m length
Mass per unit length	Individual tube: ±6%
Mill length	0/+50 mm, 6000 ≤ L ≤ 12000- 18000 mm (standard lengths 6000 & 12000 mm)
Exact length	Agreed at the time of enquiry and order

<sup>1)</sup> All external dimensions are measured with a minimum distance from the end of the section. The distance must be a minimum of 100 mm.

Characteristic	Rectangular hollow sections Tolerances meet or <b>exceed</b> the requirements of EN 10219
Outside dimensions (B, H) <sup>1)</sup>	When B, H < 100 mm $\pm 1\%$ minimum $\pm 0.5$ mm When 100 mm $\leq$ B, H $\leq$ 200 mm: $\pm 0.8\%$ When B, H > 200 mm: $\pm 0.6\%$
Thickness (T)	<b>-5%/ +10 %</b> , with a minimum of $\pm 0.2$ mm and maximum $\pm 0.5$ mm
External corner profile	When T $\leq$ 6 mm: 1.6 x T–2.4 x T When 6 mm < T $\leq$ 10 mm: 2.0 x T–3.0 x T When T > 10 mm: 2.4 x T–3.6 x T
Squareness of side	90° $\pm 1^\circ$
Concavity/convexity	0.8%, with a minimum of 0.5 mm
Twist	2 mm + 0.5 mm/m
Straightness	0.15% of total length and 3 mm over any 1 m length
Mass per unit length	Individual tube: $\pm 6\%$
Mill length	0/+50 mm, 6000 $\leq$ L $\leq$ 12000- 18000 mm (standard lengths 6000 & 12000 mm)
Exact length	Agreed at the time of enquiry and order

<sup>1)</sup> All external dimensions are measured with a minimum distance from the end of the section. The distance must be a minimum of 100 mm.

## Delivery Conditions

The tubes are cold formed and high frequency welded from thermomechanically rolled steel.

## Fabrication and Other Recommendations

### **Welding, bending and machining**

StrenxTube 700 MLH has good weldability, including corner region, and it is suitable for thermal cutting. All the common welding methods are suitable with matching or undermatching consumables.

Tubes can also be sawed and machined with regular tools. Bending of the tubes is also possible, typically at least 5xD (five times the diameter) bending radius can be achieved with regular draw bending tooling.

Hot dip galvanizing Strenx Tube 700 MLH hollow sections may lead to cracking. Please consult Tech Support prior galvanization.

For information concerning fabrication, see SSAB's brochures on [www.ssab.com](http://www.ssab.com) or consult Tech Support, [techsupport@ssab.com](mailto:techsupport@ssab.com).

Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.